

REMARKS/ARGUMENTS

Applicant respectfully requests reconsideration of this application, as amended, in view of the Office Action dated April 14, 2009. Upon entry of this Amendment, Claims 1-7, 10-12, 14-19, 23-27, and 40-41 will be pending in this application. Claims 8-9, 13, 20-22, and 28-39 have been canceled. Claims 1 and 40 are independent claims.

Support for the amendments to independent Claims 1 and 40 is found in the specification at page 8, second full paragraph, at page 5, third full paragraph, page 6, second full paragraph, page 8, third and fourth full paragraphs, and page 10, first full paragraph.

Before turning to the specific rejections of the claims, applicant offers the following general comments concerning the nature of the invention defined by Claim 1 and Claim 40, as amended. In order for a coating on a stopper to be viable as a barrier, the coat must be thin, uniform, and continuous. First, stoppers with thick plastic ends are not acceptable to consumers, and the thicker the coating, the less acceptable such stoppers are to consumers. Second, the coating must be thin, uniform, and continuous to withstand the compression process encountered during the insertion of the stoppers into bottles. Third, the coating must be thin, uniform, and continuous to reduce the flow of oxygen from the stopper into the wine and also to hinder the flow of taints from the stopper into the wine.

The coating on the stopper must also have FDA approval. Reactive hot melt polyurethane adhesives, which constitute one of the sub-layers of the barrier layer defined by Claim 1, are not FDA approved for direct food contact. The assignee of the present invention

has been able to achieve FDA approval for the preferred embodiment of the stopper falling within the scope of Claim 1, as amended, because the low permeability sub-layer contacts the wine in the bottle, instead of the reactive hot melt polyurethane adhesive sub-layer. A copy of the FDA approval is enclosed as Exhibit A. Moreover, only very thin coatings on stoppers, of the order now claimed, are acceptable because, as compared to a thick barrier layer, the reactive hot melt polyurethane adhesive sub-layer of the present invention cannot spread out from under the edges of the thin barrier layer and come into contact with the wine.

The reactive hot melt polyurethane adhesive must be applied to the stopper in a manner such that the reactive hot melt polyurethane adhesive does not appear on the cylindrical surface of the stopper. If the reactive hot melt polyurethane adhesive appears on the cylindrical surface of the stopper, smooth insertion of the stopper by the corking machinery would be difficult, if not impossible, because of the high friction between the reactive hot melt polyurethane adhesive and the glass wine bottle.

While Claim 1 defines a product and not a process, the unique construction of the stopper of Claim 1 produces advantages in the production process for the stopper. Prior art methods for the production of stoppers could not achieve a very thin, uniform, and continuous barrier layer as recited in Claim 1. Polyurethane tends to be viscous so spraying leads to either a partial coating or a complete coating that is not uniform and is stippled. Similarly, dipping leads to non-uniform coatings. In this connection, stoppers often vary in length by up to 2 mm, and therefore, in any

dipping process ensuring that the polyurethane only coats the ends of the cork, and does not migrate up the cylindrical sides, is impractical. In addition, dipping can lead to the formation of drips or result in one side of the coating on the cork being thicker than the other. Thus, known stoppers that are produced by a dipping or spraying process cannot meet the requirement of a very thin, uniform, and continuous barrier layer.

The stopper coating process must also be an automated high-speed process. Up to 16 billion cork stoppers are produced every year. The applicant has discovered that by using a reactive hot melt polyurethane adhesive sub-layer with a low oxygen permeability sub-layer, the resulting stopper has the required barrier properties, and also the barrier layer can be applied thinly, uniformly, continuously, and economically. The reactive hot melt polyurethane adhesives are particularly useful in a high-speed automated process because reactive hot melt polyurethane adhesives have instant green strength such that the barrier layer bonds instantly to the cork stopper and retains that strength so that subsequent the corking operation with stoppers placed in the bottle cannot dislodge the barrier layer.

Reactive hot melt polyurethane adhesives are not an obvious choice to meet the requirements of a wine stopper. Such reactive hot melt polyurethane adhesives are solids that become liquid only on heating. Such reactive hot melt polyurethane adhesives are viscous once melted and difficult to spread. They are unsuitable for direct food contact, they generate noxious fumes when hot, they are difficult to handle, they are even less suitable for spraying or dipping

that other polyurethanes. The reactive hot melt polyurethane adhesives generally require several days to fully cure when in contact with moisture, and they discolor when in contact with UV rays. Would the person of ordinary skill in the art expect reactive hot melt polyurethane adhesives to be useful at all in connection with the present invention? When, however, reactive hot melt polyurethane adhesives are used as a sub-layer with a lower oxygen permeability sub-layer, surprisingly, the above identified problems can be overcome. Also surprisingly is that the combination of the specific reactive hot melt polyurethane adhesive sub-layer and the other lower oxygen permeability sub-layer form a barrier layer that offers major advantages over the prior art in terms of performance as a barrier to oxygen and as a barrier to taints. Further, the barrier layer of the present invention is suitable for high-speed production processes.

The applicant has also enclosed a copy of test results of a stopper made in accordance with the present invention, the synthetic closures (Exhibit B). The oxygen barrier layer of the present invention works so well that low-grade cork stoppers performed as well as high-grade corks in inhibiting the transmission of oxygen to wine and in preventing taints migrating from the cork stoppers into the wine. This results in a major advance in the wine industry allowing the use of affordable cork stoppers that are highly effective in protecting the wine. The present invention also means that consumers may have a traditional cork stopper, which they generally find more acceptable than plastic stoppers.

The Examiner has rejected Claims 1-6, 10, 12, 14-21, 24-28, and 31-35 under 35 U.S.C. §102(b) as anticipated by WO 96/28378 (WO'378). The stopper defined by Claim 1 is different in several respects from the cork closure disclosed in the WO'378 reference.

First, the coating described in the WO'378 reference is substantially thicker than the thickness of the barrier layer defined in Claim 1, as amended. In fact, the WO'378 reference discloses a cork stopper for a wine bottle having a thick plastic coating from 0.2 to 2.0 mm or more (page 2, lines 28-31). Such a thick plastic coating is not aesthetically acceptable to consumers. Because cork stoppers are put under high stress during the corking operation, typically compressed from 24 mm to 14 mm by the jaws of the corking machine under a force of several tons, thick coatings of the kind disclosed in the WO'378 application can crease and even become fully or partially detached. If the thick plastic end of the cork stopper becomes detached, the cork stopper will perform unacceptably, and the thick plastic end may end up in the wine.

Second, although the WO'378 reference discloses curable urethane coatings, the WO'378 reference does not disclose a reactive hot melt polyurethane adhesives. Although the term polyurethanes is very broad and that there are many types of polyurethanes, a reactive hot melt polyurethane adhesive is different in many respects from other polyurethanes. Applicant has enclosed three articles (Exhibits C, D, and E) that explain that the term "reactive" has meaning that distinguishes a reactive hot melt polyurethane adhesive from other polyurethanes. While the WO'378 application does mention "urethane" adhesives, the WO'378 reference makes clear the

that curable urethane adhesives are different from the reactive hot melt polyurethane adhesives claimed herein. For example, the curable urethane adhesives disclosed in the WO'378 reference have little green strength. Because of the curable urethane adhesives disclosed in the WO'378 reference do not form a strong initial bond, such adhesives are not suitable for use with a cork stopper that experiences substantial stresses after coating while being inserted into the neck of a wine bottle.

Third, the WO'378 reference specifically discloses coatings that are food-contact approved. The reactive hot melt polyurethane adhesives required by Claim 1, as amended, are not approved for direct food contact. The assignee of the present invention has been able to achieve specific FDA approval for its preferred embodiment falling within the scope of Claim 1 as amended, because of the two layer structure defined by Claim 1. In the two layer structure, the reactive hot melt polyurethane adhesive bonds the sub-layer of low oxygen permeable material that is approved for food contact to the cork substrate.

Because independent Claim 1 is distinguishable from the WO'378 reference, dependent Claims 2-6, 10, 12, 14-19, and 24-27 are likewise distinguishable from the WO'378 reference.

The Examiner has rejected Claims 1-5, 9, 10, 12, 14-15, 17, 19, and 24-27 under 35 U.S.C. §102(b) as anticipated by WO 00/64647 (WO'647). The stopper defined by Claim 1 is different in several respects from the cork closure disclosed in the WO'647 reference.

The WO'647 reference discloses polymer coatings that can be cured by thermal curing, UV curing, electron beam curing, and gamma radiation curing. A reactive hot melt polyurethane adhesive of the present invention is not cured by any these methods. Instead, a reactive hot melt polyurethane adhesive is cured by contact with moisture. Because the WO'647 reference does not mention moisture curing, the WO'647 reference does not to disclose or suggest a reactive hot melt polyurethane adhesive.

Because independent Claim 1 is distinguishable from the WO'647 reference, dependent Claims 2-5, 10, 12, 14-15, 17, 19, and 24-27 are likewise distinguishable from the WO'647 reference.

The Examiner has rejected Claims 1-10, 12, 14, 15, 17-22, 24-29, 31-37, and 39-40 under 35 U.S.C. §102(b) as anticipated by Hanaya et al. (4,745,014). Particularly, the Examiner has taken the position that the packaging material and the sealing cap disclosed in Hanaya reference reads on the cork stopper of Claim 1 because the specification of the present application does not define or limit the term "stopper" to a particular structure.

Claim 1, as amended, is distinguished from the Hanaya reference by use of the word "stopper" in Claim 1. A stopper is a device that keeps the contents of a bottle from pouring out or spilling. The sealing cap disclosed in the Hanaya reference serves an entirely different purpose and cannot keep the contents of a bottle from spilling. The sealing cap disclosed in the Hanaya reference is known in the art as a capsule. The capsule disclosed in the Hanaya

reference is the metal foil that is wrapped around the neck and opening of a wine bottle after the cork has been inserted. The capsule is the metal foil that must be cut away before the cork of a wine bottle can be extracted. The capsule is decorative, and its only functions are to keep dirt off of the cork and act as a barrier against tampering. From even a cursory examination, the capsule disclosed in the Hanaya reference does not and cannot act as a stopper.

While applicant acknowledges that the Hanaya reference does mention sealing, that discussion is in the sense of keeping dirt off of the cork and serving as a barrier against tampering. The discussion in the Hanaya reference is not in the sense of preventing the wine from leaking or spilling out of the bottle. In addition, the capsule described in the Hanaya reference provides absolutely no barrier to oxygen. The oxygen permeability features of the claims of the present application are not disclosed in the Hanaya reference.

The applicant has enclosed an extract from Wikipedia (Exhibit F) that confirms that a stopper is a bung of rubber, cork, glass, or plastic used to close off a glass tube, piece of laboratory glassware, a wine bottle, or barrel and other containers with orifices. Applicant also draws the Examiner's attention to the American Heritage Dictionary of the English Language that defines a stopper as "a device, such as a cork or plug, that is inserted to close an opening", and to Webster's New World College Dictionary, 4th Ed. that defines a stopper as "something inserted to close an opening". The use of the term "stopper" does indeed give a particular structure which is not disclosed in the Hanaya reference.

In addition, the Hanaya reference does not disclose using a reactive hot melt polyurethane adhesive. Consequently, the Hanaya reference has little if any relevance to the claimed subject matter of the present application.

Independent Claim 40, as amended, defines a method for applying a barrier layer to a cork stopper using a reactive hot melt polyurethane adhesive. Because the Hanaya reference does not disclose a stopper or the use of a reactive hot melt polyurethane adhesive, Claim 40 is distinguishable over the Hanaya reference.

Because independent Claim 1 is distinguishable from the Hanaya reference, dependent Claims 2-7, 10, 12, 14, 15, 17-19, and 24-27 are likewise distinguishable from the Hanaya reference.

The Examiner has rejected Claims 7-9, 11, 22-23, 29-30, and 36-41 under 35 U.S.C. §103(a) as unpatentable over WO'378 in view of WO'647.

Because independent Claim 1 defines patentable subject matter for the reasons stated above, dependent Claims 7, 11, and 23 are likewise patentable.

With respect to independent Claim 40, neither the WO'378 reference nor the WO'647 reference disclose the use of a reactive hot melt polyurethane adhesive much less the use of such an adhesives in a multilayer cork stopper. Because it neither reference discloses the use of a reactive hot melt polyurethane adhesive, there is no basis for combining the two references or for producing a coated stopper with such a reactive hot melt polyurethane adhesive. Consequently,

the subject matter of independent Claim 40 is not disclosed or suggested by the references or the combination thereof.

Because independent Claim 40 defines patentable subject matter for the reasons stated above, dependent claim 41 is likewise patentable.

Examination is awaited on the merits.

If any additional fees are due in connection with the filing of this Amendment or the accompanying papers, such as fees under 37 C.F.R. §§1.16 or 1.17, please charge the fees to SGR Deposit Account No. 02-4300, Order No. 045637.005. If an additional extension of time under 37 C.F.R. §1.136 is necessary that is not accounted for in the papers filed herewith, such an extension is requested. The additional extension fee also should be charged to SGR Deposit Account No. 02-4300, Order No. 045637.005. Any overpayment can be credited to Deposit Account No. 02-4300, Order No. 045637.005.

Respectfully submitted,

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